

What is Claimed is:

1. A green Diode laser, comprising:

a tubular laser casing having a first opening end and a second opening end;

a heat sink sealedly mounted at said first opening end of said laser casing;

5 a green laser chip comprising a semiconductor chip supported by said heat sink for producing a laser beam, a lasing medium supported within said laser casing to communicate with said semiconductor chip, and an intracavity frequency doubler mounted to said lasing medium, wherein an input facet is formed at said lasing medium for said laser beam entering therein, an output facet is formed at said intracavity  
10 frequency doubler for said laser beam exiting therefrom, an optical resonant cavity is defined between said inner and output facets;

an IR blocking filter inclinedly and sealedly mounted at said second opening end of said laser casing to optically communicate with said output facet; and

a photodiode supported within said laser casing at a position that when said  
15 laser beam exits said output facet, said IR blocking filter reflects a portion of said laser beam towards said photodiode such that said photodiode is adapted for detecting said laser beam from said IR blocking filter as a feedback for controlling a power output of said green laser chip.

2. The green diode laser, as recited in claim 1, wherein said lasing medium is  
20 Nd:YAG.

3. The green diode laser, as recited in claim 1, wherein said lasing medium is Nd:YVO<sub>4</sub>.

4. The green diode laser, as recited in claim 1, wherein a 808nm anti-reflection layer, a 532nm high-reflection layer, and a 1064nm high-reflection layer are  
25 respectively coated at said input facet of said lasing medium while a 1064nm high-

reflection layer and a 532nm anti-reflection layer are respectively coated at said output facet of said intracavity frequency doubler.

5        5.    The green diode laser, as recited in claim 2, wherein a 808nm anti-reflection layer, a 532nm high-reflection layer, and a 1064nm high-reflection layer are respectively coated at said input facet of said lasing medium while a 1064nm high-reflection layer and a 532nm anti-reflection layer are respectively coated at said output facet of said intracavity frequency doubler.

10       6.    The green diode laser, as recited in claim 3, wherein a 808nm anti-reflection layer, a 532nm high-reflection layer, and a 1064nm high-reflection layer are respectively coated at said input facet of said lasing medium while a 1064nm high-reflection layer and a 532nm anti-reflection layer are respectively coated at said output facet of said intracavity frequency doubler.

15       7.    The green diode laser, as recited in claim 4, wherein a 532nm anti-reflection layer, a 808nm high-reflection layer, and a 1064nm high-reflection layer are respectively coated on a light detecting surface of said photodiode.

      8.    The green diode laser, as recited in claim 5, wherein a 532nm anti-reflection layer, a 808nm high-reflection layer, and a 1064nm high-reflection layer are respectively coated on a light detecting surface of said photodiode.

20       9.    The green diode laser, as recited in claim 6, wherein a 532nm anti-reflection layer, a 808nm high-reflection layer, and a 1064nm high-reflection layer are respectively coated on a light detecting surface of said photodiode.

25       10.   The green diode laser, as recited in claim 1, wherein a 808nm anti-reflection layer and a 1064nm high-reflection layer are respectively coated at said input facet of said lasing medium and a 1064nm anti-reflection layer is coated at said output facet of said lasing medium, wherein a 1064nm anti-reflection layer and a 532nm anti-reflection layer are respectively coated at said input facet of said intracavity frequency doubler and a 1064nm high-reflection layer and a 532nm anti-reflection layer are respectively coated at said output facet of said intracavity frequency doubler.

11. The green diode laser, as recited in claim 2, wherein a 808nm anti-reflection layer and a 1064nm high-reflection layer are respectively coated at said input facet of said lasing medium and a 1064nm anti-reflection layer is coated at said output facet of said lasing medium, wherein a 1064nm anti-reflection layer and a 532nm anti-reflection layer are respectively coated at said input facet of said intracavity frequency doubler and a 1064nm high-reflection layer and a 532nm anti-reflection layer are respectively coated at said output facet of said intracavity frequency doubler.

12. The green diode laser, as recited in claim 3, wherein a 808nm anti-reflection layer and a 1064nm high-reflection layer are respectively coated at said input facet of said lasing medium and a 1064nm anti-reflection layer is coated at said output facet of said lasing medium, wherein a 1064nm anti-reflection layer and a 532nm anti-reflection layer are respectively coated at said input facet of said intracavity frequency doubler and a 1064nm high-reflection layer and a 532nm anti-reflection layer are respectively coated at said output facet of said intracavity frequency doubler.

13. The green diode laser, as recited in claim 1, further comprising a focusing device is mounted between said semiconductor chip and said input facet for enhancing said laser beam from said semiconductor chip.

14. The green diode laser, as recited in claim 2, further comprising a focusing device is mounted between said semiconductor chip and said input facet for enhancing said laser beam from said semiconductor chip.

15. The green diode laser, as recited in claim 3, further comprising a focusing device is mounted between said semiconductor chip and said input facet for enhancing said laser beam from said semiconductor chip.

16. The green diode laser, as recited in claim 1, further comprising an electro-optic crystal mounted between said semiconductor chip and IR blocking filter within said laser casing for converting said laser beam into a pulse laser.

17. The green diode laser, as recited in claim 2, further comprising an electro-optic crystal mounted between said semiconductor chip and IR blocking filter within said laser casing for converting said laser beam into a pulse laser.

18. The green diode laser, as recited in claim 3, further comprising an electro-optic crystal mounted between said semiconductor chip and IR blocking filter within said laser casing for converting said laser beam into a pulse laser.

5 19. The green diode laser, as recited in claim 1, further comprising a single mode device is mounted between said semiconductor chip and said IR blocking filter within said laser casing for converting said laser into a single longitudinal mode laser.

20. The green diode laser, as recited in claim 2, further comprising a single mode device is mounted between said semiconductor chip and said IR blocking filter within said laser casing for converting said laser into a single longitudinal mode laser.

10 21. The green diode laser, as recited in claim 3, further comprising a single mode device is mounted between said semiconductor chip and said IR blocking filter within said laser casing for converting said laser into a single longitudinal mode laser.